

# The genus *Schwartziella* in Senegal (Gastropoda, Rissoidae)

## El género *Schwartziella* en Senegal (Gastropoda, Rissoidae)

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Recibido el 17-II-2003. Aceptado el 24-VI-2003

### ABSTRACT

The species of the genus *Schwartziella* from Senegal are revised; five species are illustrated, of which one is new to science. *S. crassior*, usually considered a synonym of *S. africana* is now considered a valid species. Two species are considered similar to others from the Cape Verde archipelago. The shell characters of all the species and some information on soft parts, opercula and radulae of some of them are shown.

### RESUMEN

Se revisan las especies del género *Schwartziella* recolectadas en Senegal, mostrando cinco especies, de las cuales una de ellas es nueva para la ciencia. Se da validez al taxon *S. crassior*, hasta ahora considerado una forma de *S. africana*. Dos especies se consideran similares a otras descritas en el Archipiélago de Cabo Verde. Se muestran gráficamente los caracteres de la concha, y alguna información sobre partes blandas, opérculo y rádula de algunas de las especies estudiadas.

KEY WORDS: Rissoidae, *Schwartziella*, Senegal, new species.

PALABRAS CLAVE: Rissoidae, *Schwartziella*, Senegal, especie nueva.

### INTRODUCTION

DAUTZENBERG (1912) described *Rissoina africana* from Senegal and mentioned the variety *crassior* being represented by two figures, plate 2, figs. 5-6 and 7-8 respectively. The types of those taxa are in the MNHN (Figs. 1, 2).

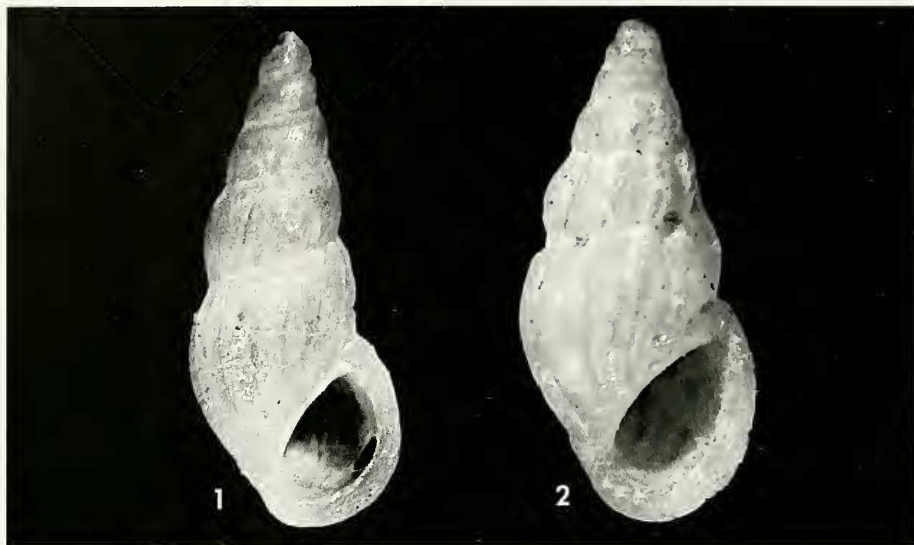
GOFAS (1999) made a revision of the African species of Rissoidae and concluded that both taxa were the same species. *Schwartziella africana* and *Rissoina punctostriata*, descrita por TALAVERA (1975) were the sole species of this subfamily considered present on the West African coast. ROLÁN AND LUQUE (2000) revised the subfamily Rissoininae from the Cape Verde Archipelago

showing the existence of an important diversification of this subfamily with 29 species, mainly in the genus *Schwartziella*, including 26 new species.

In sediment material collected in Dakar by Jacques Pelorce, and by both authors, a large quantity of shells of *Schwartziella* were examined; and the present work presents the information obtained from this study. Some specimens had opercula and remains of soft parts, but it was very difficult to obtain radulae from all the species because in many cases the soft parts were damaged and the radula was not found or was in very bad condition.

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Figures 1, 2: *Schwartzziella africana* and *S. africana* var. *crassior*, both 3.0 mm, Dakar (MNHN).  
Figuras 1, 2: *Schwartzziella africana* y *S. africana* var. *crassior*, ambas de 3,0 mm, Dakar (MNHN).

Abbreviations

MNCN Museo Nacional de Ciencias Naturales, Madrid  
MNHN Musèum National d'Histoire Naturelle, Paris

NNM Natuurhistorischen Museum, Leiden  
CER collection of Emilio Rolán  
CJH collection of José María Hernández  
CJP collection of Jacques Pelorce

SYSTEMATICS

Family RISSOIDAE Gray, 1847  
Subfamily RISSOININAE Stimpson, 1865  
Genus *Schwartzziella* Nevil, 1881

*Schwartzziella africana* (Dautzenberg, 1912) (Figs. 1, 3, 4, 12, 17, 22, 26, 27)

*Rissoina africana* Dautzenberg, 1912. Mission Gruvel. *Ann. Inst. Océanogr.*, 5 (3): 48-49, pl. 2, figs. 5-6. [Type locality: Baie de Hann, Senegal].

**Type material:** Holotype (Fig. 1) in MNHN, 3 mm.

**Other material examined:** 728 shells (of which about 40 with operculum and remaining soft parts), from several localities in Dakar, Senegal (for locality and collection details, see Table I, where sympatric species are also listed).

**Description:** See DAUTZENBERG (1912) and GOFAS (1999), where a general description of the shell is given. We add the following details: The shell (Figs. 1, 3, 4) is whitish. The protoconch (Fig. 17) is of the non-planktotrophic type with a di-

ameter of about 315  $\mu$ m and of one spiral whorl; its surface has irregular flat elevations. The teleoconch has five whorls with a slightly curved profile; the axial ribs are opisthocline, almost rectilinear and the interspaces are of similar size; there are 15-

Table I. Material studied from the Dakar area in the CER, CJP and CJH.

*Tabla I. Material estudiado del área de Dakar en las colecciones CER, CJP y CJH.*

	<i>S. africana</i>	<i>S. crassior</i>	<i>S. yragoae</i>	<i>S. cf. puncticulata</i>	<i>S. cf. hoenselaari</i>
Le Tacoma 6-12 m (CER)	61		224	6	
Le Tacoma 13 m, Epave (CER)	152		528	12	
Le Tacoma 15 m Epave (CER)	167		375	21	
Ngor, 14 m, in Palythoa (CER)	81	5	3	24	7
Madeleines 15-30 m (CER)	36	2	53	23	3
East Madeleines 6-14 m (CER)	36	1	140	1	
NE Madeleines, Oune, 18 m (CER)	20	1	60		
Petit Thiouriba, 33 m (CER)	3		13	1	
Grand Thiouriba, 30 m (CER)	7		8	1	
Cap Vert, Pa Maquete, 33 m (CER)	21				
Between Gorée and Dakar, 20 m (CER)		24	29		
Ngor, in beach sediments (CER)	50	4		6	
Dahomey, 27-30 m (CER) in Bouquet			6	5	
S of Gorée, 5-8 m (CER)	10	2	7	8	5
Grand Thiouriba, 40 m (CJP)	10		91		
Tacoma Epave, 13 m (CJP)	22		60		
Les Madeleines, 10-30 m (CJP)	3				
S of Gorée 3-6 m (CJH)	8	8	5	4	11
Petit Thiouriba, 30-35 m (CJH)	1	3	3	1	
Seminoles, 20-25 m (CJH)	1			2	
S of Gorée, 3-6 m (CJH)	37	27	11		5
Oceanium Diver Center, 0-6 m (CJH)	2	5	1		
Total	728	82	1617	115	31

17 ribs on the last whorl (Fig. 12). When the shell is fresh, it is rather translucent and the soft parts or sand can be seen in its interior. Microsculpture (Fig. 22) of irregular threads visible mainly on the intervals between the ribs.

*Dimensions:* most of the material studied is between 2.8 and 3.5 mm high; in some populations, shells can reach 3.7 mm.

Periostracum evident and yellowish to orange in color.

Operculum (Figs. 26, 27) whitish, transparent and with a marginal nucleus.

Radula (not illustrated) was examined by optical microscope and showed no difference from that of *S. cf. puncticulata* (see below).

*Distribution:* Known only from Senegal. In the Dakar area, it is one of the most common species being present in nearly all of the collecting locations.

*Remarks:* *S. africana* was the first Rissoiinae found on the West African coast as mentioned by DAUTZENBERG (1912).

We have made measurement of the larger shells of our material from several lots and they always were smaller than 3.7 mm. The size referred in GOFAS (1999) as up to 5.25 mm, may be due of the inclusion of shells of other species in this taxon which usually does not reach this size.

*S. africana* differs from any other from European and Cape Verde Islands species mainly because of its transparency, scarcely curved profile, opisthocline axial ribs, and its fine microsculpture.

From other Senegal species living sympatrically, Table II shows the most important differences.

Table II. Characters of the species from Dakar.

Tabla II. Caracteres de las especies de Dakar.

	diameter of the protoconch	size in mm	consistency	axial ribs on last whorl	ribs	position of ribs	space between ribs	profile of whorls
<i>S. africana</i>	316	2.8-3.7	solid	15-17	almost rectilinear	opisthocline	some as ribs	slightly convex +
<i>S. crassa</i>	291	2.5-3.4	very solid	11-13	almost rectilinear	orthocline	wider than the ribs	slightly convex ++
<i>S. yragoae</i> spec. nov.	312	2.4-3.4	less solid	8-11	S-curved	strongly opisthocline	double that of ribs	convex +++
<i>S. cf. punctulata</i>	315	3.8-4.1	very solid	12-14	almost rectilinear	orthocline or very slightly opisthocline	similar to ribs	strongly convex on upper part +++
<i>S. cf. hoenselaari</i>	328	2.5-3.0	fragile	8-10	almost rectilinear	orthocline or very slightly opisthocline	wider than the ribs	slightly convex +

*Schwartziella crassior* (Dautzenberg, 1912) (Figs. 2, 5, 6, 13, 18, 24)

*Rissoina africana* var. *crassior* Dautzenberg, 1912. Mission Gruvel. *Ann. Inst. Océanogr.*, 5 (3): 48, pl. 2, figs. 7-8. [Type locality: Baie de Hann, Senegal].

**Type material:** Holotype (Fig. 2) in MNHN, 3 mm.

**Material examined:** 82 shells from the Dakar area (see Table I for further explanation).

**Description:** DAUTZENBERG (1912) dedicates only one paragraph to this species which he considers as simply a form of *S. africana*. GOFAS (1999) also considers this species as a form of *S. africana*. Thus, a redescription is necessary.

Shell (Figs. 2, 5, 6) length up to 3.4 mm, maximum width 1.5 mm, solid, elongate-conic, not transparent.

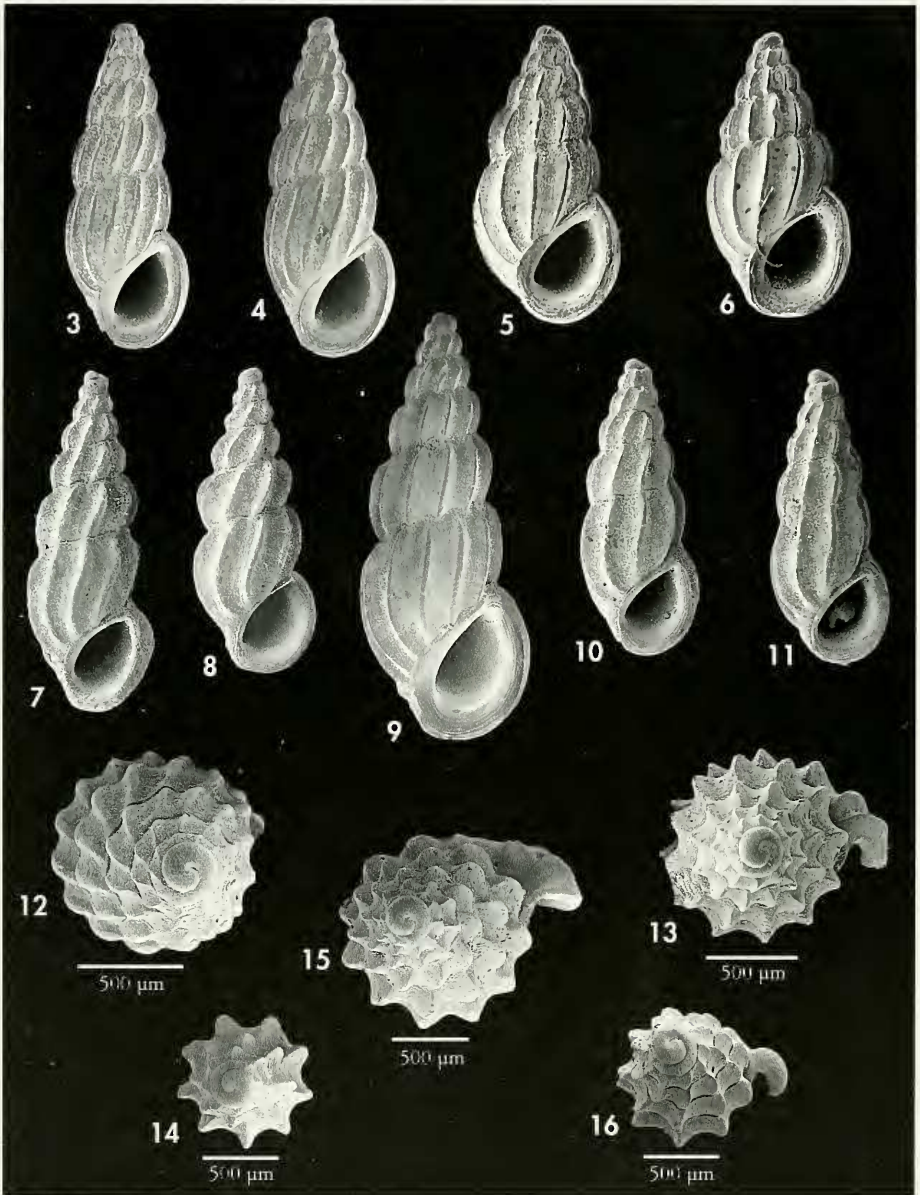
Protoconch (Fig. 18) of 1 whorl of about 290 µm maximum diameter, of non-planktotrophic type, with no spiral sculpture; transition to teleoconch abrupt. Microsculpture formed by very numerous irregular flat prominences.

Teleoconch of 4-4 1/2 whorls, slightly convex, not angulated below the suture;

last whorl convex; suture shallow but evident. Color whitish.

Axial sculpture (Fig. 13) consisting of prominent rounded narrow orthocline (slightly opisthocline on early whorls), very distantly spaced axial ribs; numbering 11-13 on the last whorl. Spiral sculpture almost invisible at low magnification. Microsculpture (Fig. 24) with irregular threads visible mainly in the interspaces between ribs.

Aperture D-shaped, small to medium-sized; inner lip thick; columellar side weakly concave; anterior channel absent; outer lip strongly opisthocline with a very thick external varix; peristome narrow with about 4



Figures 3-16. Shells of *Schwartzziella* species from Dakar, Senegal. 3, 4: *S. africana*, 3.1, 3.3 mm; 5, 6: *S. crassior*, 2.8, 2.4 mm; 7, 8: *S. yragoae*, holotype, 3.3 mm (MNCN) and paratype, 2.8 mm (MNHN); 9: *S. cf. puncticulata*, 4.1 mm; 10, 11: *S. hoenselaari*, 2.5, 2.5 mm; 12: *S. africana*, apical view; 13: *S. crassior*, apical view; 14: *S. yragoae*, paratype (CER), apical view; 15: *S. cf. puncticulata*, apical view; 16: *S. hoenselaari*, apical view.

*Figuras 3-16. Conchas de las especies de Schwartzziella de Dakar, Senegal.* 3, 4: *S. africana*, 3,1, 3,3 mm; 5, 6: *S. crassior*, 2,8, 2,4 mm; 7, 8: *S. yragoae*, holotipo, 3,3 mm (MNCN) y paratipo, 2,8 mm (MNHN); 9: *S. cf. puncticulata*, 4,1 mm; 10, 11: *S. hoenselaari*, 2,5, 2,5 mm; 12: *S. africana*, vista apical; 13: *S. crassior*, vista apical; 14: *S. yragoae*, vista apical; 15: *S. cf. puncticulata*, vista apical; 16: *S. hoenselaari*, vista apical.

parallel lines toward the inner part of the aperture.

*Distribution:* Known only from some localities in Dakar area. It is generally uncommon and was not found in all localities (see Table I for the places of collecting).

*Remarks:* This species is consistently different from *S. africana*, but only by examining a large quantity of shells it is possible to appreciate these constant differences. In comparison with *S. africana*, *S. crassior* is smaller, wider, and not

transparent; the axial ribs are orthocone and less numerous.

The similar species from the Cape Verde Islands may be differentiated: *S. typica* Rolán and Luque, 2000 has a spiral cord on the protoconch and different microsculpture; *S. luisi* Rolán and Luque, 2000 has spiral cords; *S. minima* Rolán and Luque, 2000 is smaller and has more prominent spiral sculpture; *S. hoenselaari* Rolán and Luque, 2000 has a spiral sculpture with smooth interspaces and the axial ribs are lower in number.

### *Schwartziella yragoae* spec. nov. (Figs. 7, 8, 14, 19, 29, 30, 32)

**Type material:** Holotype (Fig. 7) of 3.3 mm height, deposited in MNCN 15.05/46610; paratypes in the following collections: MNHN (1); CER (25); CJH (10) and CJP (10).

**Other material examined:** 1617 shells (about 30 with remains of the soft parts and operculum), from the Dakar area (see Table I for additional explanation).

**Type locality:** Dakar, Senegal.

**Etymology:** The species is named after Cristina Garcia Yrago, wife of the junior author, for her many years of patience and cooperation.

*Description:* Shell (Figs. 7, 8) length up to 3.5 mm, maximum width 1.3 mm, not very solid, elongate-conic, not transparent.

Protoconch (Fig. 19) of a little more than 1 whorl of about 310  $\mu$ m of maximum diameter, of non-planktotrophic type, without any spiral sculpture; transition to teleoconch abrupt. Microsculpture formed by very numerous irregular flat prominences.

Teleoconch of 4-5 strongly convex whorls, not angulated below the suture; last whorl strongly convex; suture deep and evident. Color whitish.

Axial sculpture (Fig. 14) consisting of prominent sharp, narrow, S-curved, strongly opisthocline separate axial ribs, which seem to extend from whorl to whorl, being less prominent near the base. Their number is 9-11 on the last whorl. Spiral sculpture not evident without magnification. Microsculpture formed by irregular threads visible mainly in the interspaces between the ribs.

Aperture D-shaped, medium sized; inner lip thick; columellar side weakly

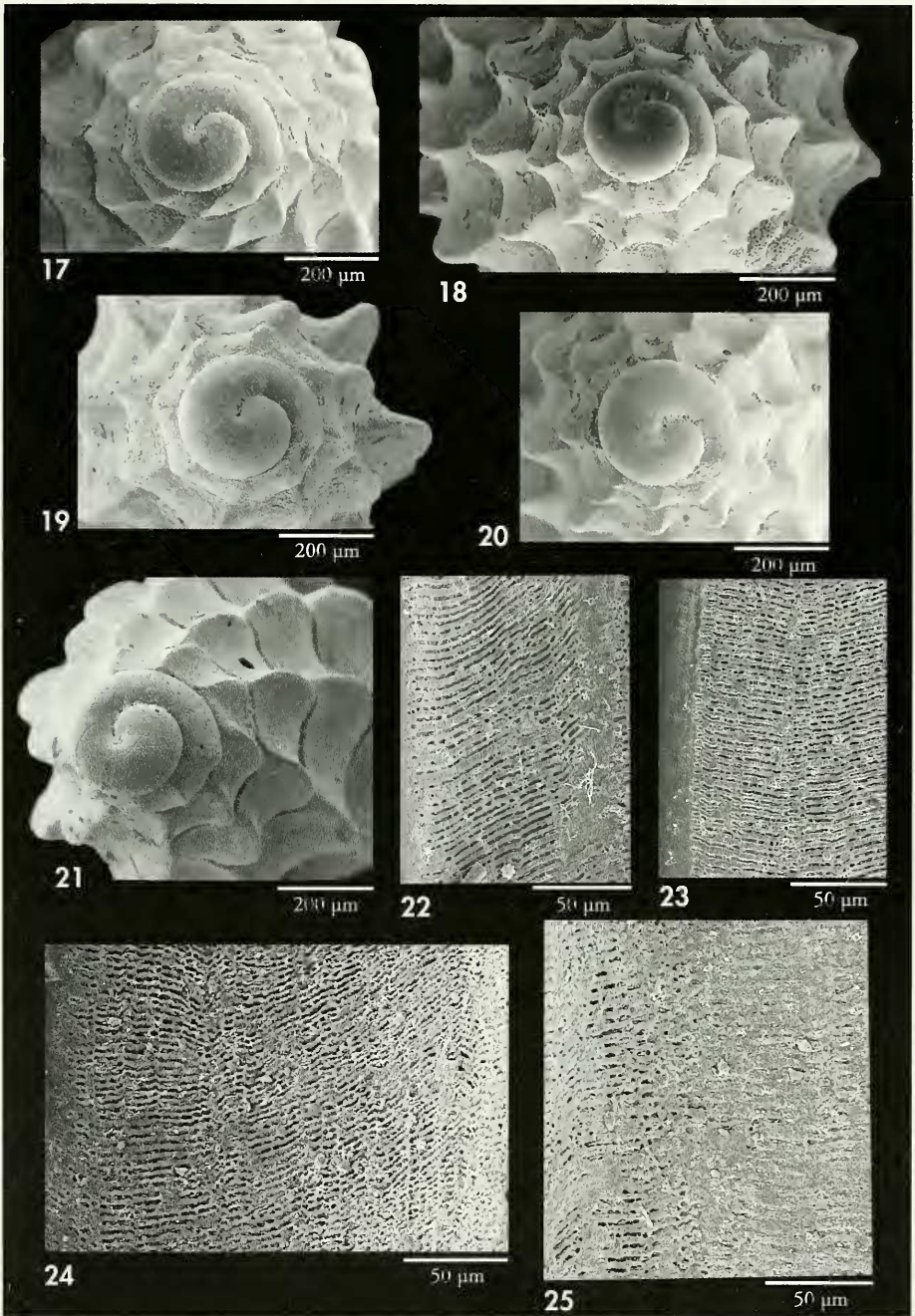
concave; anterior channel nearly absent; outer lip strongly opisthocline, with thick external varix; with a few parallel lines toward the inner part of the aperture.

Operculum (Figs. 29, 30) whitish, transparent, with marginal nucleus.

Radula (Fig. 32) with a rachidian tooth with a pair of basal denticles, and a scarcely prominent central cusp with 5-7 small cusps at each side. Inner marginal teeth finely denticulate; outer marginal teeth without any denticles on the external margin.

*Distribution:* The species is known from Dakar, where it is the most common species collected at practically all the collecting points.

*Remarks:* *S. yragoae* spec. nov. is very different from all the species known from Cape Verde Islands and Senegal for the following particular characters: the S-curved, strong, sharp and narrow axial ribs, numbering 11 or fewer on the last whorl, and the very convex whorls and deep suture. This species lives sympatrically with the other species present in Senegal without intergrades.



Figures 17-21. Protoconchs: 17: *S. africana*; 18: *S. crassior*; 19: *S. yragoae* spec. nov.; 20: *S. cf. puncticulata*; 21: *S. cf. hoenselaari*. Figures 22-25: Microsculpture. 22: *S. africana*; 23: *S. cf. puncticulata*; 24: *S. crassior*; 25: *S. cf. hoenselaari*.

Figuras 17-21. Protoconchas: 17: *S. africana*; 18: *S. crassior*; 19: *S. yragoae* spec. nov.; 20: *S. cf. puncticulata*; 21: *S. cf. hoenselaari*. Figuras 22-25: Microsculptura. 22: *S. africana*; 23: *S. cf. puncticulata*; 24: *S. crassior*; 25: *S. cf. hoenselaari*.

*Schwartziella* cf. *puncticulata* Rolán and Luque, 2000 (Figs. 9, 15, 20, 23, 28, 31, 33)

*Schwartziella puncticulata* Rolán and Luque, 2000. *Iberus*, 18 (1): 58, figs. 85-87.

**Type material:** Holotype in NNM. Paratypes, see ROLÁN AND LUQUE (2000).

**Material examined:** 5 live specimens, Dahomey, 10 Km south of Dakar, 27 m; 115 shells (five alive collected) from the Dakar area (see Table I for additional explanation).

*Description:* See ROLÁN AND LUQUE (2000). Shells from the Dakar population are figured (Figs. 9, 15), as well as the protoconch (Fig. 20) and microsculpture (Fig. 23).

The animal (Fig. 33) was observed alive: it is whitish in color, with narrow and elongate tentacles, the male has a curved penis.

Operculum (Figs. 28) whitish and transparent.

The radula (Fig. 31) has a rachidian tooth with a pair of basal denticles, and a prominent central cusp with 5-6 small cusps at each side. Lateral tooth with about 10 cusps at the inner border; inner marginal teeth finely denticulate; outer marginal teeth without any denticles on the external margin.

*Distribution:* If the present population is the same species as that described from Cape Verde Islands, it is known only from that archipelago and Senegal.

*Remarks:* We did not find important differences between these shells from Dakar and the Cape Verde material, therefore we included them tentatively in that taxon. The shells from Dakar are slightly smaller (up to 4.1 mm, against 4.5 in the Cape Verde shells); also the protoconch is smaller (about 315  $\mu$ m against 360 for the Cape Verde shells). The shells frequently appear decolled at the apex, which is not the case in the Cape Verde populations. Finally, the microsculpture is more pitted in the Cape Verde shells than in the Dakar ones, where there are threads.

But all those differences are not very important and thus we consider probably both conspecific. Our only doubt arises how a species with non-planktotrophic development might be present in such widely separate places, but human action may be considered through the frequent traffic between the islands and the main coast.

*Schwartziella* cf. *hoenselaari* Rolán and Luque, 2000 (Figs. 10, 11, 16, 21, 25)

*Schwartziella hoenselaari* Rolán and Luque, 2000. *Iberus*, 18 (1): 60, figs. 88-92.

**Type material:** Holotype in NNM. Paratypes, see ROLÁN AND LUQUE (2000).

**Material examined:** 31 shells from the Dakar area (see Table I for more explanations).

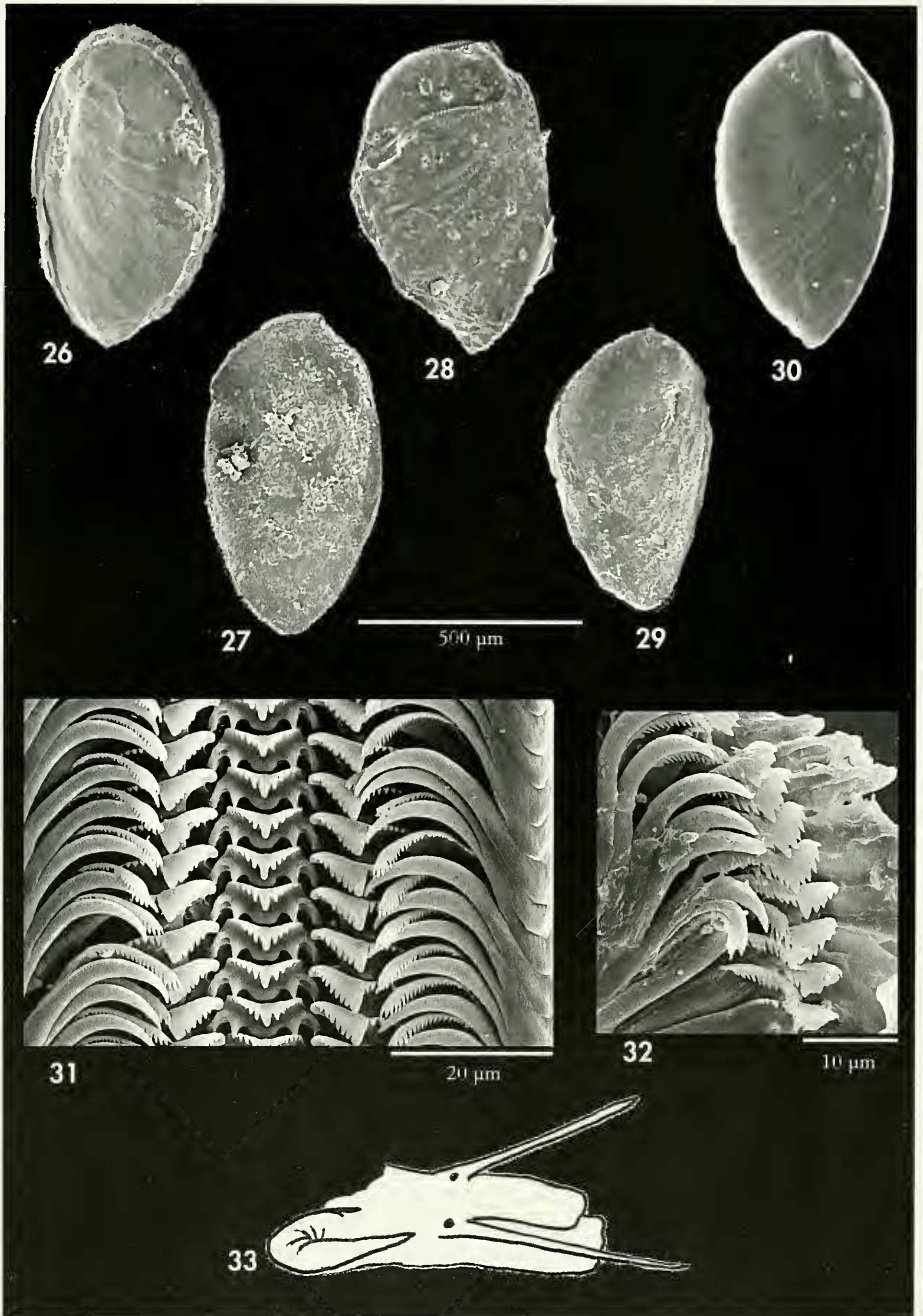
*Description:* See ROLÁN AND LUQUE (2000). Shells from Dakar area are figured (Figs. 10, 11, 16), as well as the protoconch (Fig. 21) and the microsculpture (Fig. 25).

*Distribution:* If the present is the same species as described from Cape Verde, only known from this archipelago and Senegal.

*Remarks:* We did not find important differences between the shells from Dakar and those from Cape Verde, thus we included them tentatively in this taxon with the Cape Verde material. The shells from Dakar are slightly narrower than the

holotype but not from other shells represented in the original description. The protoconch is smaller in the type material (about 300  $\mu$ m against 315 for the Dakar shells), and the microsculpture is a little different, in the type material having alternating lines without microlines. But all these are scarcely important differences and so we consider probably both conspecific. We have the same doubt as in the preceding species about how a non-planktotrophic species may be present in such widely separated places, but we consider the same explanation for this presence.





Figures 26-30. Opercula. 26, 27: *S. africana*; 28: *S. cf. puncticulata*; 29, 30: *S. yragoae* spec. nov. Figures 31, 32: Radulae: 31: *S. cf. puncticulata*; 32: *S. yragoae* spec. nov. Figure 33. Animal drawing of *S. cf. puncticulata*.  
*Figuras 26-30. Opérculos. 26, 27: S. africana; 28: S. cf. puncticulata; 29, 30: S. yragoae spec. nov. Figuras 31, 32: Radulas: 31: S. cf. puncticulata; 32: S. yragoae spec. nov. Figura 33. Dibujo del animal de S. cf. puncticulata.*

## CONCLUSIONS

In Dakar, there are several species of *Schwartziella*. In the present work, five are described. This is not a final number of the Dakar species, because some shells collected in small quantity and not mentioned in the present work could be different.

The species studied in Dakar are difficult to separate on the basis of additional characters like protoconch or microsculpture, because they are very similar to each other. Only the shell characters are constantly different (general shape, profile, high/width ratio, features of the axial ribs).

The presence and abundance of the species studied was very variable in sediments from different localities in Dakar. Probably, this means that each species has its own particular habitat, and the abundance of the shells of each

species in sediments varies according to the presence of this habitat in each area.

The different species have some degree of sympatry in each locality, as it is evident by sampling in several localities; the differences of the characters between these species are constant without intergrades.

## ACKNOWLEDGMENTS

The authors thank Jacques Pelorce, Le Grau du Roi, France, for his collecting in Dakar where important information was recorded and also for the sediments and for the material sent for the present study. To Jesús Méndez of the Centro de Apoyo Científico y Tecnológico a la Investigación (CACTI) of the University of Vigo for the SEM photographs. To the MNHN for the loan of the type material.

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